

## **ABSTRACT**

### **P450 OXYGENASES AND METHODS OF USE**

This disclosure provides the nucleic acid and protein sequences of novel P450 oxygenases that utilize, at least, taxoid substrates, including taxadiene isomers. The disclosed oxygenases, such as a taxoid 5 $\alpha$ -hydroxylase, hydroxylate, at least, the C5 position of a taxoid. Also provided are methods of introducing oxygen at the C5 position of a taxoid and methods of producing the anti-cancer drug, paclitaxel (also known as Taxol<sup>TM</sup>), and other taxoids, such as paclitaxel intermediates.